



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,343	06/02/2006	Hirofuma Fujimaru	0075868-000097	5041
21839 7590 03/11/2009 BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404				
EXAMINER				
SASTRI, SATYA B				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
03/11/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

### Office Action Summary

**Application No.**

10/581,343

**Applicant(s)**

FUJIMARU ET AL.

**Examiner**

SATYA B. SASTRI

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 July 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-13 and 15-22 is/are rejected.  
7) ☒ Claim(s) 14 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 02 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-85/86)  
Paper No(s)/Mail Date 7/29/08, 2/23/07, 9/20/06, 6/2/06  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Inventor's Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This office action is in response to application filed on 6/2/06. Preliminary amendment filed on 6/2/06 is made of record. Claims 1-22 are now pending in the application.

#### ***Drawings***

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings submitted are poor quality. Figures B-D have poor contrast. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 9, 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "the water content" in the body of the claim. There is insufficient antecedent basis for this limitation in the claim.

The language in claim 17 is confusing because in line 2, the water absorbent resin (A) is recited as being water-insoluble. However, the last line of the claimed method recites "...said water absorbent resin as being in the form of solution or a slurry". It is unclear as to how something that is water-insoluble can be in the form of a solution. It is unclear if the "solution" referred to is an organic solution. Further, it is also unclear as to how a water absorbent resin in the form of solution or slurry can have 0% by wt. of water content as recited in the claim. Per specification (PGPUB, US 2007/0101644, 0093-0094), the polyvalent metal compound appears is added in the form of a solution or a slurry.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 1-13, 15-22 are rejected under 35 U.S.C. 103(a) as obvious over Hatsuda et al. (US 5,140,076) and as evidenced by <http://www.wovenwire.com/reference/particle-size.htm>.

The prior art to Hatsuda et al. discloses a method of treating the surface of absorbent resins such as those based on crosslinked products of partially neutralized polyacrylic acid which are invariably in a powdered form (abstract, col. 3, lines 8-24). The disclosed surface treating agent include hydroxides, halogenides or sulphates of calcium, magnesium, iron, aluminum, may be used alone or in combination in amounts of 0.01 to 30 parts by wt. (col. 4, lines 37-60). Furthermore, water may be used during the mixing of the absorbent resin powder with the crosslinking agent in amounts of 0 to 50 parts by wt. (col. 5, lines 1-29, col. 8, lines 52-68, col. 9, lines 1-21). The absorbent by the method may be used as a water-proofing agent for agriculture and horticulture (col. 10, lines 44-49). The working example 3 discloses that the crosslinked resin particles are passed through a 20-mesh metal gauze.

The evidence reference provides evidence to the fact that the 20 mesh metal gauze affords particle sizes within the particle size range recited in instant claim 1.

The prior art fails to disclose water retaining material comprising carboxylic group-containing water-insoluble absorbent resin and polyvalent metal compound as claimed presently.

The prior art discloses a small genus of water absorbent resins that includes crosslinked carboxyl group-containing resins. Further, polyvalent metal compounds are disclosed as useful for surface treatment agents. Thus, it would have been obvious to one of ordinary skill in the art to utilize polyvalent metal compounds to surface treat carboxyl group-containing water insoluble resins.

It is the examiner's position that the presently claimed property (i.e. absorption capacity, calcium gradual release index) must be intrinsic to the Hatsuda et al. product because the composition and particle dimension as presently claimed in claims 1-3 are taught by Hatsuda et al.

Further, the disclosed process of producing water absorbent resin comprising the water absorbent polymer and polyvalent metal includes either drying mixing or mixing the components in the presence of 0 to 40% by wt. of water, similar to the process as recited in instant claims 17 and 19 (see paragraph 3 above). With regard to claim 18, it may be well within the level of ordinary skill in the art to affect the mixing process with 0-40% water so as to optimize the surface reaction conditions. The resultant process must result in the water absorbent resin having the polyvalent metal compound deposited on the surface as presently claimed in claims 1, 5 and 6.

Further, the crosslinked polyacrylic acid such that disclosed in example 3 must intrinsically have the soluble component within the presently claimed range of claim 16 given that the polymer is crosslinked.

With regard to claim 8, the prior art in working example 1 discloses crosslinked partially neutralized polyacrylic acid derived from sodium acrylate having a neutralization ratio of 75 mol%.

8. Claims 1-13, 15-17, 19, 20 are rejected under 35 U.S.C. 103(a) as obvious over Kimura et al. (US 5,026,800).

Kimura et al. disclose water-absorbent resin having an average particle diameter of 100 to 600 microns (abstract). The water absorbent resin comprises self-crosslinking type resin prepared

from anionic and cationic monomers or slats thereof and nonionic hydrophilic ethylenically unsaturated monomers (col. 3, lines 50-68, col. 4, lines 1-62). The polymer powder obtained by is dried to contain less than 10% by wt. of water and further mixed with 0.005 to 20% by wt. of a crosslinking agent, such as polyvalent metal with calcium, magnesium, aluminum etc. to affect crosslinking on the particle surface (col. 7, lines 40-55 and col. 8, lines 59-69). The polymer powder may be mixed with a solution of crosslinking agent and subjected to heat treat at temperatures ranging from 40-250°C.

The prior art fails to disclose water retaining material comprising carboxylic group-containing water-insoluble absorbent resin and polyvalent metal compound as claimed presently.

The prior art discloses that water-insoluble absorbent resins may be derived from anionic ethylenically unsaturated monomers, including those with carboxylic acid groups (col. 3, lines 50-68). The polyvalent metal compounds are disclosed as preferred surface crosslinking agents for heat treatment at temperatures ranging from 40-250°C. It is noted that the instant specification discloses an overlapping temperature range for the polyvalent metal compound slurry treatment of 20-80°C (PGPUB, 0096). Thus, the prior art discloses carboxyl group-containing water absorbent resin particles (presently claimed (A)) as well as surface crosslinking reaction with 0.005 to 20% by wt. polyvalent metal compound (presently claimed (B)) at 40-250°C to prepare water absorbent resin particles with particle size ranging from 100-600 microns. Therefore, it would have been obvious to one of ordinary skill in the art utilize polyvalent metal compounds to coat the surface of carboxyl group containing internally crosslinked polymers and thereby arrive at the presently cited claims.

It is the examiner's position that the presently claimed property (i.e. absorption capacity, calcium gradual release index) must be intrinsic to the Kimura et al. product because the composition and particle dimension as presently claimed in claims 1-3 read on the water absorbent resin of Kimura et al. ). Further, it is also noted that the water absorption capacity for the inventive samples are in excess of 20g/g as presently claimed. Although polyvalent metals are not disclosed as crosslinking agents in the working examples, the disclosure teaches them as functionally equivalent to those utilized in the working examples.

Additionally, drying of resin particles must result in the water within the presently claimed range of claim 9 (col. 9, lines 38-59). Given that that the amount of polyvalent metal compound overlaps with that claimed presently, and given that sodium polyacrylates and acrylic acid-sodium acrylate copolymers are disclosed as water absorbent resins, the monovalent and polyvalent ion contents must be within the presently claimed range, absent evidence to the contrary.

The limitation "for cultivating plant" in the claim language is the intended use language. The intended use language must result in a structural difference to patentably distinguish over the prior art. If the prior art structure or composition is capable of performing the intended use, then it meets the claim. MPEP 2112.02.

With regard to claim 10, the disclosed polyvalent compounds overlap in scope with those in the instant disclosure and thus, must intrinsically have the presently claimed solubility.

With regard to claim 11, given that calcium and magnesium polyvalent compounds are disclosed as useful surface crosslinking agents, use of a combination of calcium and magnesium polyvalent compounds as surface crosslinking agents is within the level of ordinary skill in the



art. It is well settled that it is *prima facie* obvious to combine two ingredients, each of which is targeted by the prior art to be useful for the same purpose. *In re Lindner* 457 F.2d 506,509, 173 USPQ 356, 359 (CCPA 1972).

With regard to claim 16, it is the examiner's position that the soluble content of the water absorbent resin of Kimura at all must be within the presently claimed range given that the amount of internal crosslinking agent and the polymerization technique overlap in scope with that disclosed in the instant specification (0035, 0037 0040).

Based on the prior art process, it would have been within the level of ordinary skill in the art to mix the resin powder and the polyvalent metal compound in powder state and subsequently add water as claimed presently in claim 19. Selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results *In re Burhans*, 154 F.2d 690, 69 USPQ, 330 (CCPA 1946).

9. Claims 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (US 5,026,800) in view of Williams et al. (WO 98/49252).

The discussion with regard to Kimura et al. above in paragraph 8 is incorporated herein by reference.

The prior art fails to disclose the use of the water absorbent resin in horticulture.

Secondary reference to Williams et al. is in an analogous field of water absorbent resin for horticultural purposes. Given the art recognized suitability of water absorbent resins for horticultural purposes, it would have been obvious to one of ordinary skill in the art to utilize the resins of Kimura et al. for such purposes because the resins of Kimura et al. exhibit superior

water absorption capacity, water absorption rate, suction force and gel strength (col. 1, lines 10-15).

***Allowable Subject Matter***

10. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record does not teach or suggest the presently claimed polyvalent metal compound as an ash of incineration.

11. The X references cited in the International Search Report (WO 98/49252A, EP0945052, US 4,587308 and JP0907850A) are considered to be cumulative to or of less relevance compared to the prior art relied upon in the rejection above.

***Conclusion***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272 1112. The examiner can be reached on Mondays, Thursdays and Fridays, 7AM-5.30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. David Wu can be reached on 571-272-1114.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Satya B Sastri/

Examiner, Art Unit 1796